



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,315	09/18/2003	Yiou-Wen Cheng	250320.1040	5447
24504 7590 01/10/2007 THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			EXAMINER CHAU, COREY P	
			ART UNIT	PAPER NUMBER
			2615	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/665,315

Applicant(s)

CHENG ET AL.

Examiner

Corey P. Chau

Art Unit

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 4, 6, 8, 13, 15, and 23-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. The term "about" in claims 4, 6, 8, 13, 15, and 23-24 is a relative term which renders the claim indefinite. The term "about" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 5-18, and 21-28 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 4053711 to DeFreitas et al. (hereafter as DeFreitas).
6. Regarding Claim 1, DeFreitas discloses a multi-channel surround sound expansion method comprising the steps of:

reading a stereo sound signal including a left sound signal and a right sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17);

expanding said stereo sound signal into a Front L channel, a Front R channel, a Front M channel, a Rear L channel and a Rear R channel sound signals (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37);

performing a sound reverberation operation on sound signals of said Front L channel and said Front R channel or said Rear L channel and said Rear R channel to generate sound with echo/reverberation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37);

delaying said Rear L channel and Rear R channel sound signals for a first time value (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37); and

advancing said Front M channel sound signal for a second time value (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

7. Regarding Claim 2, DeFreitas discloses said step of expanding said stereo sound signal into multi-channel sound signals is accomplished by using a Hafler technique to output said left sound signal directly to said Front L channel, output said right sound signal to said Front R channel, output said left sound signal minus said right sound signal to said Rear L channel, and output said right sound signal minus said left sound signal to said Rear R channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Art Unit: 2615

8. Regarding Claim 5, DeFreitas discloses said Front M channel sound signal is a sound signal having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

9. Regarding Claim 6, DeFreitas discloses the frequency response of said low-pass filtering operation is **about** -30 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

10. Regarding Claim 7, DeFreitas discloses said Rear L channel and Rear R channel sound signals are sound signals having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

11. Regarding Claim 8, DeFreitas discloses the frequency response of said low-pass filtering operation is **about** -30 dB at 10 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

12. Regarding Claim 9, DeFreitas discloses said step of expanding said stereo sound signal into multi-channel sound signals is accomplished by a Hafler technique to directly output said left sound signal minus said right sound signal to said Front L channel, output said right sound signal minus said left sound signal to said Front R channel, output said left sound signal to said Rear L channel, and output said right sound signal to said Rear R channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

Art Unit: 2615

13. Regarding Claim 10, DeFreitas discloses said Front L channel and Front R channel sound signals are sound signals having high-frequency components filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

14. Regarding Claim 11, DeFreitas discloses the frequency response of said low-pass filtering operation is **about** -30 dB at 10 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

15. Regarding Claim 12, DeFreitas discloses said Front M channel sound signal is a sound signal whose high-frequency components are filtered out through a low-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

16. Regarding Claim 13, DeFreitas discloses. The multi-channel surround sound expansion method as claimed in claim 12, wherein the frequency response of said low-pass filtering operation is **about** -30 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

17. Regarding Claim 14, DeFreitas discloses said Rear L channel and Rear R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

18. Regarding Claim 15, DeFreitas discloses the frequency response of said high-pass filtering operation is **about** -10 dB at 6 KHz (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Art Unit: 2615

19. Regarding Claim 16, DeFreitas discloses said multi-channel sound signals further include a super bass channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

20. Regarding Claim 17, DeFreitas discloses said super base channel sound signal is obtained by using at least a low-pass filtering operation to filter out high-frequency components of said left sound signal and said right sound channel (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

21. Regarding Claim 18, DeFreitas discloses said Front M channel sound signal is a mean of said left sound signal and said right sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

22. Regarding Claim 21, DeFreitas discloses said multi-channel sound signals further include at least a Middle L channel sound signal and at least a Middle R channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

23. Regarding Claim 22, DeFreitas discloses said Middle L channel sound signal is a copy of said Rear L channel sound signal, and said Middle R channel sound signal is a copy of said Rear R channel sound signal (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 37).

24. Regarding Claim 23, DeFreitas discloses said first time value is between **about** 10 and 20 ms (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

25. Regarding Claim 24, DeFreitas discloses said second time value is between **about** 2 and 4 ms (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

26. Regarding Claim 25, DeFreitas discloses said sound reverberation operation is accomplished through a feedback delay networks technique (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

27. Regarding Claim 26, DeFreitas discloses a plurality of delay queues and a queue matrix are provided in said feedback delay networks technique, a channel sound signal is input into said delay queues to generate a plurality of delay signals fed back to said delay queues via said queue matrix, and said channel sound signal is finally added to said channel to form a continually fed-back sound with reverberation (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

28. Regarding Claim 27, DeFreitas discloses said delay signals generated by said delay queues are obtained by setting a delay constant to said delay queues (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

29. Regarding Claim 28, DeFreitas discloses delay times generated by said delay queues are different from one another (abstract; Figs. 1 and 5-6; column 2, line 59 to column 3, line 17; column 6, line 29 to column 8, line 64).

Art Unit: 2615

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

31. Claims 3-4 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4053711 to DeFreitas.

32. Regarding Claim 3, DeFreitas does not expressly disclose said Front L channel and Front R channel sound signals are sound signals having low-frequency components filtered out through a high-pass filtering operation. However, the examiner take Official Notice that it is well known in the art provide a filter which filters out low-frequency components in order to provide a desired frequency response. Therefore it would have been obvious to one having ordinary skill in the art to modify DeFreitas to incorporate a filter which filters out low-frequency components in order to provide a desired frequency response.

33. Regarding Claim 4, DeFreitas as modified does not expressly disclose the frequency response of said high-pass filtering operation is **about** -10 dB at 6 KHz. However, the examiner takes Official Notice that it is well known in the art to modify a filter in order to obtain the desired frequency response. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify DeFreitas as modified to modify a filter, wherein the filter operation is about -10 dB at 6 KHz in order to obtain the desired frequency response.

34. Regarding Claim 19, DeFreitas does not expressly disclose said multi-channel sound signals further include a Rear M channel sound signal. However, the examiner takes Official Notice that it is well known in the art to provide a Rear M channel sound signal in order to an enhance surround sound and more realistic sound. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify DeFreitas to incorporate a Rear M channel sound signal in order to an enhance surround sound and more realistic sound.

35. Regarding Claim 20, DeFreitas does not disclose said Rear M channel sound signal is a mean of said Rear L channel and Rear R channel sound signals. However, the examiner takes Official Notice it is well known in the art that the mean of said Rear L channel and Rear R channel sound signals is used in order to generated a desired Rear M channel sound signal. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify DeFreitas to utilize the mean of said Rear L channel and Rear R channel sound signals is used in order to generated a desired Rear M channel sound signal.

Conclusion

36. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPN 5129004 to Imai et al discloses an automotive multi-speaker audio system with different timing reproduction of audio sound.

USPN 5257313 to Fujishita et al discloses a surround sound apparatus.


USPN 5146507 to Satoh et al discloses an audio reproduction characteristics control device.

37. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P. Chau whose telephone number is (571)272-7514. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

January 8, 2007
CPC


VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600